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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/516,927	12/01/2004	Lay Har Angeline Tee	DR10-006	8720
21567	7590	04/27/2006	EXAMINER	
WELLS ST. JOHN P.S. 601 W. FIRST AVENUE, SUITE 1300 SPOKANE, WA 99201			OLSEN, ALLAN W	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 04/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/516,927	TEE ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Allan Olsen	1763	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 February 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☒ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Objections*

Claim 7 is objected to because of the following informalities: "pyrochatecol" should be --pyrocatechol--.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 9-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Claims 9, 11 and 13 each recite, "...further including the steps of: before the first layer of silicon is etched...". Claim 1, upon which these claims are dependent, includes two steps in which the first layer is etched. The further steps of claims 9, 11 and 13 only makes sense if they occur after the first etching of the first layer of silicon. Therefore, the recitation of "before the first layer of silicon is etched" presumably means before the second etching of the first silicon layer. It should be noted that the two etching steps are not explicitly identified as a first and a second etching step. The claims are not limited with respect to the temporal relationship between the two first silicon layer etching steps. The step whereby pyramidal apertures are etched would necessarily be first if the first layer of silicon was completely etched away as a result of the claimed "etching away the first layer of silicon". However, the claimed "etching away the first

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layer of silicon” could constitute as step in which only a portion of the first silicon layer is etched away. As such, the claims are not limited with respect to the temporal relationship between the two etching steps. This claim analysis and interpretation is relevant to claim 2 as well. The claimed “final etch” is directed to the latter occurring etching step which, in principle, could be the step that creates pyramidal apertures, if such were to occur after a step in which a portion of the first silicon layer is etched away.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1, 4-6 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 4,685,996 issued to Busta et al. (hereinafter, Busta).**

Busta teaches a method of making a silicon probe tip. Busta teaches etching with KOH or a mixture of ethylenediamine and pyrocatechol, through a patterned mask, to form pyramidal cavities in a first layer of n-type doped silicon. Busta teaches forming a p-type doped Si layer on the layer of n-type doped silicon. Busta teaches etching away the n-type doped silicon. See: figures 1A- 1D and column 2, lines 35-68.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 2, 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Busta.**

Busta does not teach and using an electrochemical etch or using tetramethylammonium hydroxide as the etchant. Busta does not teach reversing the dopants such that the starting substrate is of the n-type Si and the probe tip is formed from p-type Si.

It would have been obvious to one skilled in the art to use an electrochemical etch or to use tetramethylammonium hydroxide as the etchant because these are well known as functionally equivalent to the silicon etching methods taught by Busta. It would have been obvious to one skilled in the art that the type of doping could be reversed, because Busta's technique relies on the etch stop that occurs at a p/n junction. The skilled artisan would readily appreciate that the etch stop is functional regardless of the direction from which you approach the p/n junction. As such, a skilled artisan would have more than a reasonable expectation of success upon reversing the polarity of the process.

**Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 4,685,996 issued to Gray et al. (hereinafter, Gray) in view of U S Patent 6,156,216 issued to Manalis et al. (hereinafter, Manalis).**

Gray teaches a method of forming a probe tip by etching pyramidal cavities into doped silicon then depositing probe material into the cavity and etching away the doped silicon. Gray teaches the probe material can be a metal or a semiconductor. Gray teaches etching with KOH or ethylenediamine/pyrocatechol. See figures 7-14

Gray does not teach using silicon for the probe material. Gray does not teach using an electrochemical etch or using tetramethylammonium hydroxide as the etchant.

Manalis teaches making probe tips from doped silicon (column 3, line 30 - column 4, line 10).

It would have been obvious to one skilled in the art to deposit oppositely doped silicon as the probe material when carrying out the method of Gray because Gray teaches that the probe material can be a semiconductor and Manalis teaches that doped silicon probes tips are very useful for atomic force microscopes (column 4, lines 6-10). It would have been obvious to one skilled in the art to use an electrochemical etch or to use tetramethylammonium hydroxide as the etchant because these are well known as functionally equivalent to the silicon etching methods taught by Gray.

#### ***Allowable Subject Matter***

Claims 9-14 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the

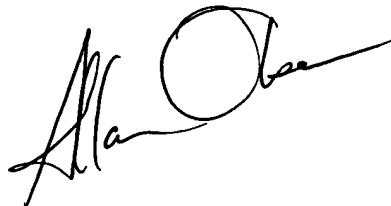
limitations of the base claim and any intervening claims. It should be noted that if applicant incorporates the limitations of claim 9 into claim 1, they should also cancel claims 10-14.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 571-272-1441. The examiner can normally be reached on M-F 1-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Allan Olsen', with a large circular flourish at the end.

Allan Olsen  
Primary Examiner  
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